中文字在全像立體影像中辨識度研究

研究生：黃祺雅　　指導教授：黃雅玲

崑山科技大學視覺傳達設計研究所

摘　要

　　由於科技技術的發展卓越，各種高科技媒材的運用呈現方式更為多元，在立體影像科技迅速成長的時代下，人們已不再僅侷限於閱讀平面資訊裡的訊息了，隨著各種訊息顯示，文字能夠與三維空間並存，且在立體空間中呈現多變效果，將會是未來趨勢。

　　各種三維化表現方式中，雷射全像是一個重要的發展系統，在本論文中主要透過雷射全像，探討中文字於反射式全像內的運用方式，與辨識度使用極限，從文字編排設計、視覺詩的手法運用、反射式全像的概況等，在既有的文獻資料當中，彙整出屬於反射式全像與文字編排之間的關係，進而運用簡政珍的詩文內容，以視覺詩為主要概念延伸創作全像作品。而最後目的，也是希望藉由對於中文文字運用在反射式全像當中，能夠切確的控制於限制範圍之內，使未來在跨領域的設計師或藝術家，在創作文字運用於全像作品時的參考依據，並在創作時，具有更有效的掌握與運用。

透過實驗得到以下結果：

1. 在中文字體有其辨識度的極限，當中文字筆劃越多越複雜時，文字會隨著筆劃的改變辨識度也會越低，在閱讀上也越為困難。

2. 結合全像技術時，中文字的筆劃越多，會比筆劃少的文字辨識度來的明顯越低。拍攝時距離全像片-1cm 時最小級數為 8pt、距離全像片-2cm 時最小級數為 11pt、距離全像片-3cm 時最小級數 12pt 為容易辨識範圍。

3. 當立體文字運用於反射式全像時，X、Y、Z 軸皆為 0° 時，立體文字在辨識度上不會因為厚度的改變影響辨識度。

4. 當立體文字以底部為軸心，逆時針方向旋轉 X 軸 45°、90°時，以字體厚度 2.1cm 旋轉 X 軸 45°為辨識度最高。

5. 立體文字右側為軸心，順時針方向旋轉 Z 軸 45°、90°時，以字體厚度 2.1cm 旋轉 Z 軸 45°為辨識度最高。

關鍵字：全像立體影像、中文字、視覺詩、辨識度

A Research on the Recognition of Chinese Character in Holography

Graduate Student：Huang, Chi-Ya   Advisor: Huang, Ya-Ling

Graduate School of Visual Communication Design

Kun Shan University

Abstract

Due to the outstanding development of technology, the application of hi-tech media is going to be multiple. Living in the era of holographic technology, the information people read is no longer limited in flat media. Through the display technology, characters is able to be displayed in a three dimensional space. It is a future trend to represent multi effect in a stereo space.

In all the 3D display systems, laser holography is an important system. In the thesis it aims to explore the application of Chinese characters and the limitation of character recognition in reflection hologram. The reference integrates character editing design, the application of visual poetry, and the brief of reflection holography. The creations partly apply Jian Zheng-Zhen's poetry, and take the visual poetry as the main concept to extend the holographic works. The purpose in the end is to control the Chinese characters in limited range, and give designer and artist a reference when they are going to apply characters in hologram. This will make them work efficiently. Five conclusions are made through the experiment:

1. There is recognition limitation for Chinese characters. When the number of strokes in a Chinese character is a lot or complex, the recognition of characters reduces through the increase of strokes, and it will cause difficulties for reading.

2. After combining Chinese characters with holography, the recognition of characters with more strokes is obviously lower than the characters with fewer

strokes.   The limitations of recognition range are: the minimal font size is 8pt when the distance of object and holographic plate is 1cm, the minimal font size is 11pt when the distance of object and holographic plate is 2cm, the minimal font size is 12pt when the distance of object and holographic plate is 3cm.

3. When applying stereo characters as the object to make reflection hologram, the recognition of stereo characters with different thickness will not change when X, Y, and Z axis are all 0°.

4. When taking the bottom of the stereo characters as the axle center, and rotating 45° and 90° toward X axis in the counterclockwise direction, the stereo character with 2.1cm which rotates 45° toward X axis has the best recognition.

5. When taking the right side of the stereo characters as the axle center, and rotating 45° and 90° toward Z axis in the clockwise direction, the stereo character with 2.1cm which rotates 45° toward Z axis has the best recognition.